

ABSTRACT

An object is to provide apparatuses for plasma processing which can make the distribution of the film thickness of a substance on a substrate uniform, methods of processing a substrate therewith, apparatuses for plasma-enhanced chemical vapor deposition, and methods for film formation therewith.

When a desired substance is vapor deposited on the surface of a substrate (3), characteristics of the distribution of the thickness of a film on the substrate having a large area are improved by eliminating local imbalance in the distribution of the film thickness originating from deviation in the distribution of voltage on the ladder electrode (2), by way of adjusting impedance matching between each coaxial cable and corresponding feeding point for the ladder-shaped electrode (2) using branch cables provided to the coaxial cables for supplying high-frequency electric power to a ladder-shaped electrode (2) so as to make the film thickness uniform in the direction at right angles with the direction of fed electric power, whereby high-frequency electric power which is fed to each longitudinal electrode rod (2a) of the ladder-shaped electrode (2) can be adjusted, and distribution of voltage at a right or left part of the substrate and distribution of voltage at a central part of the substrate can be balanced, as well as by way of promoting uniformity in the distribution of the film thickness in the direction of fed electric power, by supplying streams of high-frequency electric power having the same frequency from two power supplies to the ladder-shaped electrode (2) with the phase difference between the high-frequency electric powers being varied over time.